

## CLAIMS

What is claimed is:

1. A method of debugging software comprising:

obtaining a software module;

5 obtaining a first input test vector;

obtaining a bug list;

generating a first output vector by applying said first input test vector to said software  
module;

10 applying a comparison test to said first output vector to determine whether a bug  
exists in said software module;

applying a module decomposition test to said software module when the result of said  
comparison test is positive; and

appending said software module and said first input test vector to said bug list when  
the result of said module decomposition test is negative.

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2. The method of claim 1 wherein said comparison test comprises:

obtaining an optimal result vector;

comparing said first output vector to said optimal result vector; and

determining whether said first output vector is at variance with said optimal result

20 vector.

3. The method of claim 2 wherein the step of generating a bug list further  
comprises:

obtaining a module decomposition list comprising two or more submodules of said software module when the result of said module decomposition test is positive; and iteratively processing said module decomposition list.

5           4. The method of claim 3 wherein the iterative processing step comprises:  
obtaining a second input test vector such that the application of said second input test vector to said submodule will generate a second output test vector; and  
recursively processing said submodule and said second output test vector.

10           5.       The method of claim 4 wherein the trimming step comprises:  
obtaining said minimal module;  
obtaining said first input test vector; and  
applying a vector decomposition test to said first input test vector.

15           6.       The method of claim 5 further comprising:  
generating a third output vector by applying said first input test vector to said minimal module when the result of said vector decomposition test is negative;  
applying said comparison test to said third output vector to determine whether said first input test vector recreates the bug; and  
20           appending said input test vector to a test list when the result of said comparison test is positive.

7.       The method of claim 6 further comprising:

